

Date: Mon, 6 Jun 94 04:30:32 PDT
From: Ham-Homebrew Mailing List and Newsgroup <ham-homebrew@ucsd.edu>
Errors-To: Ham-Homebrew-Errors@UCSD.Edu
Reply-To: Ham-Homebrew@UCSD.Edu
Precedence: Bulk
Subject: Ham-Homebrew Digest V94 #152
To: Ham-Homebrew

Ham-Homebrew Digest Mon, 6 Jun 94 Volume 94 : Issue 152

Today's Topics:

 Getting a VFO on-frequency
 Phase noise floor of Motorola CMOS PLL dividers
 simple SSB receiving methods
 SMALL HT POUCHES 4SALE
 SSB Filters (3 msgs)
 Syntor mods

Send Replies or notes for publication to: <Ham-Homebrew@UCSD.Edu>
Send subscription requests to: <Ham-Homebrew-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Homebrew Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-homebrew".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.

Date: Sun, 5 Jun 1994 23:49:11 GMT
From: munnari.oz.au!newshost.anu.edu.au!harbinger.cc.monash.edu.au!trlluna!titan!
pcies4.trl.OZ.AU!drew@tcgould.tn.cornell.edu
Subject: Getting a VFO on-frequency
To: ham-homebrew@ucsd.edu

In article <2snptv\$ai1@tekadm1.cse.tek.com> royle@tekgp4.cse.tek.com (Roy W
Lewallen) writes:

>From: royle@tekgp4.cse.tek.com (Roy W Lewallen)

>Subject: Re: Getting a VFO on-frequency

>Date: 3 Jun 1994 17:40:15 GMT

>From: drew@trl.oz.au (Drew Diamond)

>

>>And (this may start an argument) leave out that useless little diode at the
>>gate- it does no good that I can see, and sometimes causes a deterioration
>>in output and stability.

>

>Sorry, Drew, you're right -- I've gotta argue with your statement. The diode
>has a very noticeable and measurable beneficial effect on stability. Both
>Wes, W7Z0I, and I have confirmed this. The diode acts as a clamp, never
>conducting more than very, very slightly. It prevents the FET gate-source
>diode from conducting, which would load the tank circuit, reducing its Q
>and increasing drift. In my experiments, a schottky or germanium diode does
>degrade the stability, for reasons I've never investigated. Perhaps it's
>because of the larger reverse leakage currents of these types. But a
>1N914-type silicon diode does effect a very apparent improvement in
>stabililty.

>

>Roy Lewallen, W7EL
>roy.lewallen@tek.com

Thank-you Roy. I read that part (in Solid State Design I think). However, I
stand by what I have said, having built literally hundreds of different
VFO's (both bread-board and "finished"), my observation is that the diode
does little to improve frequency stability.

I would dearly like to know who started this diode hoax- for that's what
it is- and just about every USA-published circuit perpetuates the myth.

73, Drew, VK3XU. Telecom Australia Research Laboratories

Date: 6 Jun 94 05:10:02 GMT
From: news.delphi.com!BIX.com!jdow@uunet.uu.net
Subject: Phase noise floor of Motorola CMOS PLL dividers
To: ham-homebrew@ucsd.edu

myers@cypress.West.Sun.COM (Dana Myers) writes:

>Does anyone have empirical information on the phase noise floor of the
>dividers in the Motorola CMOS PLL chips, such as the MC145157 and MC145170?
>I'm tending to guess towards -150dBc, a number I've seen published for
>CMOS dividers, but is this accurate?

>This is of particular interest with respect to the on-chip reference
>divider in the Motorola CMOS PLLs. I would guess the phase noise
>level of the reference frequency, when driven with the on-chip oscillator
>using a crystal, is going to be primarily determined by the divider.

>Any comments?

>---

> * Dana H. Myers KK6JQ, DoD#: j | Views expressed here are

*
> * (310) 348-6043 | mine and do not necessarily
*
> * Dana.Myers@West.Sun.Com | reflect those of my employer
*
> * This Extra supports the abolition of the 13 and 20 WPM tests *

There is no single number you can attribute to a noise floor. I satisfied myself of that one with MECL and TTL many nasty years ago. You CAN, however, make some interesting calculations that prove to be fairly accurate. The first stage is perhaps the most important one. It is the stage which converts your oscillator signal into digital. From there most of the rest of the noise can be "neglected" for first approximations. The problem comes in when you divide the input frequency. The more you divide the more the input noise, which is basically DC to infrared or so, aliases onto your desired signal. By the time you have divided by a thousand or more this becomes "significant" in low noise designs.

As an aside, I find it amusing to be worried about noise when using the on chip oscillator. They do not usually drive a crystal into a highly stable low noise regime. Nor would the onchip conversion from the chip's oscillator to digital be all that low noise.

{0.0} jdown@bix.com

Date: Mon, 6 Jun 1994 01:01:57 GMT
From: ihnp4.ucsd.edu!agate!msuinfo!harbinger.cc.monash.edu.au!trlluna!titan!pcies4.trl.OZ.AU!drew@network.ucsd.edu
Subject: simple SSB receiving methods
To: ham-homebrew@ucsd.edu

In article <2shr81\$br8@mail.fwi.uva.nl> agterkam@fwi.uva.nl (Dirk-Jan Agterkamp (I89)) writes:

>From: agterkam@fwi.uva.nl (Dirk-Jan Agterkamp (I89))
>Subject: simple SSB receiving methods
>Date: 1 Jun 1994 11:25:53 GMT
>Summary: simple SSB receiving methods
>Keywords: SSB
>Currently I'm planning to build a receiver, who doesn't.
>However, my intension is NOT to use Xtal filters and NOT
>to use a large number of OPAMPS to create sharp lowpass
>filters. My plan is to use a phasing method instead.

>Can anyone give me some advice on how to solve the phase shift
>problem. Does a simple and inexpensive method exist to phase

>shift a wide spectrum of, lets say, 100 kHz by 45 degrees ?
>
>Thanks in advance, Dirk. e-mail: agterkam@fwi.uva.nl
>

Dirk, maybe this is one of those areas where no really simple approach will give satisfactory results. See Richard Hosking's paper in Electronics & Wireless World, Mar. '94, where he describes a direct conversion receiver using the polyphase method. Details are given for an experimental polyphase audio phase shift network and also a cunning way of obtaining your 90 degree L.O. signals. Perhaps not as simple as you would wish however.

73, Drew, VK3XU Telecom Australia Research Laboratories.

Date: 6 Jun 94 06:17:53 GMT
From: dog.ee.lbl.gov!newshub.nosc.mil!cg57.esnet.com!bbs.dsnet.com!
usenet@ucbvax.berkeley.edu
Subject: SMALL HT POUCHES 4SALE
To: ham-homebrew@ucsd.edu

★VERSA-POUCHES★

!!!!!!2 VERSIONS!!!!!!

YAESU FT-11R and small HT owners,

For those of you that have requested HOLD DOWN STRAPS on the VERSA-POUCH,

We now have another version of the VERSA-POUCH with hold down straps.
Which

holds down your HT and prevents it from falling out of the case.

Because of this new version, the CASE PRICE will slightly increase to 6.00 per

case, 5.50 for 2 or more. If interested please send a reply message ASAP.

The makers of this pouch will only produce, these POUCHES with hold down straps,

by request. So let me know how many you want and we'll take it from there...

Depending on the size of the order, it'll take 1 day, for single pouches to

1 Week plus, for larger orders. Also, because of this NEW VERSION, the VERSA-

POUCH can be customized to fit MOST small HT's, but you'd need to pay & order

in advance.

PRICE BREAK DOWN:

MODEL #: VP-1-NS

Regular Pouch, no hold down straps = \$4.00 or \$3.50ea. for 2 or more.

MODEL #: VP-1-WS

NEW VERSION Pouch, with hold down straps = \$6.00 or 5.50ea. for 2 or

more.

Even for \$6.00, you still can't go wrong!!!!

PLEASE DO NOT FORGET TO INCLUDE SHIPPING...

Thanks again to many of you for your interests and suggestions... SPREAD
THE

WORD...

73 David.

Date: 6 Jun 94 05:03:45 GMT
From: news.delphi.com!BIX.com!jdow@uunet.uu.net
Subject: SSB Filters
To: ham-homebrew@ucsd.edu

dstock@hpmoca.sqf.hp.com (David Stockton) writes:

>Elendir (elendir@enst.fr) wrote:

>: I know little about helicoidal filters, so I d be pretty interested in knowing
>: more.

> Connaissez-vous "Handbook of filter synthesis" par Anatol I Zverev,
>John Wiley and sons inc New York 1967 ISBN 0 471 98680 1 ?
>chapitre 9 "Helical filters" . c'est le tome definitif pour le dessein
>mathematique des filtres.

Zverev is an EXCELLENT book. I cannot recommend it highly enough.

> Also, I d like to know what frequency swing you can expect from a Xtal
>: oscillator modulated by a varicap diode.

> (sorry, my French isn't adequate for this part..)

> It depends a lot on the frequency, the circuit, and production
>tolerances. With care a 200 ppm (parts per million) tuning range can be
>reasonably reliably achieved for a favourable frequency and circuit.

Um, 200ppm pretty much wants more than a simple varicap to make it happy. Even with carefully selected (and spurious de-Q-ed inductors) past 200ppm it is remarkably easy to get into odd spurious oscillations due to crystal spurs. As you mention, I'd never try pulling an overtone crystal farther than its base frequency tolerance at best. (I learned that one the hard way. Just barely made that one work.)

> David GM4ZNX

{^_^} jdown@bix.com

Date: 6 Jun 94 04:51:17 GMT
From: news.delphi.com!BIX.com!jdown@uunet.uu.net
Subject: SSB Filters
To: ham-homebrew@ucsd.edu

k23690@proffa.cc.tut.fi (Kein{nen Paul) writes:

>Elendir (elendir@enst.fr) wrote:

>> What I'd like to find out is a 10.7003 to 10.703 Xtal Filter, with at least
>> 60 dB at 10.6997 MHz. But a 9 MHz look-alike filter (or any IF) would
>> fit also.

>It is hard to find asymmetric USB (and LSB) filters these days.
>In a few years old design for 9 MHz IF, KVG XFM-9B01 and XFM-9B02
>were used. I am not sure which one is LSB and which one is USB as
>contradictory information was given in the article.

>If you settle for a single symmetrical SSB filter, then different
>BF0-frequencies for USB and LSB are needed, but the number of suitable
>filters is much larger. One source for 10.7 MHz filters in England is
>Cirkit (tel. +44-992-441306).

10.7Mhz is not exactly well suited for high quality SSB crystal filter design.

Crystals DO change frequency with both temperature and time. Not all crystals, even of similar cuts, change the same way by the same amount. Hence the crystal filter characteristics will change with temperature, such as for Field Day operation, and with time, due to crystal aging. Most of my designs selected much lower IFs when I had the luxury of "doing it right." 5MHz was the highest I figured was marginally acceptable.

>If you think about a single conversion design, 9 or 10.7 MHz IF is quite
>low, usable at 144-146 MHz, but if you are going to use it on 70 cm,
>you should put separate helical front end filters for the 432 MHz DX-
>band and the 435-438 MHz satellite band.

Wellllll, single conversion is not nice no matter how you do it unless you are REALLY anxious to maintain low power operation. For VHF I'd go to a dual conversion with first conversion up to the 70Mhz to 140MHz range. For UHF I'd consider a first IF of 70MHz quite workable. For 144MHz - who uses it? (LA bias. {^_-}) For 144MHz I'd use a 21.4MHz 16KHz wide filter in the first IF and double convert to between 455KHz (mechanical filters) to 5MHz. (I find the filters required in things like Syntors to be a royal PITA because of their necessary narrow bandwidths. They are required to reduce the half-IF response as much as anything. (Fr +/- 1/2 Fif response) I'd rather select something a little less stringent based on requirements for reducing chances of front end overload and if possible custom tailor it to that function.

> Paul OH3LWR
>

>-----
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>Mail : Hameenpuisto 42 A 26
> FIN-33200 TAMPERE
> FINLAND

(I designed VERY high dynamic range radios for DoD usages for about 20 years before I discovered software burned my fingers a LOT less than soldering irons and was easier as well. At least one design was able to operate with no alteration in BER when receiving -109dBm signals in the presence of inband -5dBm signals (which was as high as I could conventiently generate with the test lashup.) So I have a half an idea what I am doing and am TERRRRRIBLY opinionated. I also do not reveal ham licence call for reasons of privacy having faced a nasty threat based on it.)

{^_^} jdown@bix.com

Date: Mon, 6 Jun 1994 09:37:20 GMT
From: ihnp4.ucsd.edu!sdd.hp.com!apollo.hp.com!hpwin055.ukst!hpqmoea!
dstock@network.ucsd.edu
Subject: SSB Filters
To: ham-homebrew@ucsd.edu

Date: Sun, 05 Jun 1994 18:48:58 pdt
From: pa.dec.com!dodeca!clyde%ucrmath.ucr.edu@decwrl.dec.com
Subject: Syntor mods
To: ham-homebrew@ucsd.edu

I understand that the Motorola Syntor commercial mobile
rig can be modified for ham usage but I can't find the mods
for it on ftp.cs.buffalo.edu. Anyone have the mods anywhere?

civ

End of Ham-Homebrew Digest V94 #152
